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Género e decisões de gestão: Evidência nas empresas Portuguesas

Gender and managerial decisions: Evidence on Portuguese firms

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Dissertação apresentada à Universidade de Aveiro para cumprimento dos requisitos necessários à obtenção do grau de Mestre em Economia - Finanças, realizada sob a orientação científica da Doutora Elisabete Fátima Simões Vieira, Professora Coordenadora do Instituto Superior de Contabilidade e Administração da Universidade de Aveiro.

Dedico este trabalho a toda a minha família pelo incansável apoio.

O júri

Presidente

Professora Doutora Anabela Botelho Veloso,
Professora Catedrática Universidade de Aveiro

Professora Doutora Raquel Filipa Do Amaral Chambre De Meneses Soares Bastos Moutinho
Professora Auxiliar da Faculdade de Economia da Universidade do Porto

Prof. Doutora Elisabete Fátima Simões Vieira
Professora Coordenadora do Instituto Superior de Contabilidade e Administração da Universidade de Aveiro

Agradecimentos

A vida é feita de etapas. A dissertação revela-se uma etapa de grande importância por representar o reconhecimento de um percurso académico que contribuí para uma maior capacidade de responder a futuras adversidades e constituí uma preparação não apenas académica, mas de carácter. Desta forma, gostaria de agradecer às pessoas que mais influência tiveram para que fosse possível este término deste percurso. Desde já um agradecimento à Professora Doutora Elisabete Fátima Simões Vieira, pela sua orientação e dedicação ao longo de toda a dissertação. Seguidamente, um agradecimento especial aos meus pais, pelo amor, carinho e formação ao longo dos anos, às minhas 3 irmãs incansáveis em todos os momentos difíceis e a todas as suas palavras de incentivo, motivação e coragem. Um agradecimento ao meu namorado, por todo o apoio e compreensão. Um agradecimento à minha tia e aos meus avós, sem os quais não teria sido possível o conforto durante a realização desta dissertação. E por fim, mas não menos importante, aos meus patrões, pela sua atenção e compreensão.

Palavras-chave Género, diversidade, composição, desempenho, decisões de gestão, grandes empresas, diretores, mulheres.

Resumo

A presença das mulheres nos mais diversos aspetos da vida das sociedades tem sofrido modificações ao longo dos anos. Com este trabalho pretende analisar-se o efeito da diversidade do género na rendibilidade das empresas, considerando para tal uma amostra de empresas portuguesas que têm uma importância acrescida para a economia, já que se consideram na amostra as empresas destacadas pela Revista Exame, na sua edição anual de 2013 como sendo as "500 Maiores e Melhores" empresas. Os resultados apresentam evidência de que a presença das mulheres nos quadros das empresas gera efeitos negativos no desempenho das empresas. Este resultado poderá estar relacionado com o grau de risco associado às decisões e políticas implementadas pelos quadros administrativos onde participam mulheres. De um modo geral, os resultados permitem concluir que a presença de mulheres nos quadros terá influência no funcionamento do quadro administrativo e da própria empresa.

Keywords Gender, diversity, composition,performance, management decisions, large companies, directors, women.

Abstract The presence of women in various aspects of life of societies has changed throughout the years. This work aims to analyse the effect of gender diversity in the profitability of firms, considering, for such study, a sample of Portuguese firms that have increased importance for the economy, since we consider the companies highlighted by “EXAME” Magazine in its annual 2013 edition as the "500 Biggest and Best" companies. The results show evidence that the presence of women on boards of directors of the companies generates negative effects on firm’s performance. This result may be related to the degree of risk associated with the decisions and policies implemented by administrative boards where women participate. Overall, the results suggest that the presence of women on boards of directors will influence the functioning of the board of directors and the company itself.

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1. INTRODUCTION

We live in a modernized world, which arises as a consequence of the phenomenon of globalization. As the name itself suggests, globalization has allowed many people, from different cultures, all over the world, to contact with each other. This contact has led the population to a better understanding of the world and its reality.

This permanent contact and inter community communication also conducted to different opinions, and originated conflicts between these communities, originating the Two World Wars that we know. These two wars changed the way people lived, with men in the front of the combat, women occupied men's position in daily duties. This means that, with the emergence of the two wars, women began to play roles that, until then, corresponded only to men.

The capitalist regime started to integrate the daily life of societies, initiating a change of mentality with regard to women and their rights, as well as their professional situation, giving place to several laws concerning the integration of women in the labour market.

There was, subsequently, an increase of the demand for female work force, causing women to invest on their educational and professional training. This concern made them, after a few years, a qualified and specialized work force, able to perform functions in high positions that became very attractive for companies all over the world.

As a consequence of this "acquisition" to the labour market, the need to understand the implications of this new contribution caused several authors to dedicate their time and work to subjects where women would be the focus of their analysis, especially when women assume important positions on firm's boards or in top management. (Hoffman & Maier, 1961; Carter et al., 2003; Daily& Dalton, 2003).

Apart from being a timely and important topic, Europe has already a higher percentage of female population, representing about 51.2% of the population in the 27 countries in 2011, according to information provided by the PORDATA website[1]. The estimated value for female population in Portugal, for 2011, is 52.2%, close to the European Union (EU) value. Table 1 shows some information about the European population.

[1] www.pordata.pt

Table 1: Resident Population in European Union and Portugal

Year: 2011	Gender			Female Population (%)
	Total	**Male**	**Female**	
EU27 – European Union (27 Countries)	502 642 207	245 364 573	257 277 886	51.20
PT - Portugal	10 557 560	5 041 990	5 515 570	52.20

Source: PORDATA

Table 2 shows some information about the active population.

Table 2: Active Population in European Union and Portugal

Year: 2011	Gender			Female Active Population (%)
	Total	**Male**	**Female**	
EU27 – European Union (27 Countries)	239 297.2	130 479.9	108 817.3	45.50
PT - Portugal	5 543.2	2 940.5	2 602.6	47.00

Source: PORDATA

As we can see from the table, in 2011, around 45% of the EU population were considered active population. In Portugal, it represented, in 2011, 47% of the population, a value slightly higher than in the EU.

In this study, our main objective is to know the weight of female representation on the boards of the 500 biggest and best Portuguese companies, highlighted by EXAME Magazine, as well as to understand what kind of roles women play in these companies, trying to analyse if they belong to common work force, or on the contrary they occupy a pivotal position on companies' boards or top management. Consequently, we formulate three questions and try to answer them with this study:

- What is the importance of female directors in the 500 biggest and best organizations used in the study?
- Can the risk aversion of women directors affect the risk level of the firm and enrich the firm's performance?
- What characteristics of the organizations influence the presence of women on boards?

This study leads to a deeper level of investigation; therefore, we attempt to understand the gender influence on companies' decisions, and how it can affect their outcomes and performance in a direct way. This analysis is relevant to the extent that the entry of women into the labour market in a more intense and active way allows the discussion of the role and position they hold in society, deepening and enriching the studies produced so far. Companies around the world continue, these days, to discuss issues about the diversity of ethnicity, cultural differences and the implementation of measures related to such problems. The diversity of gender and its implications in various aspects of life in society, like the issues mentioned earlier, is a current topic that deserves the same or more attention and lacks for analysis, discussion and implementation of measures.

We find evidence that the presence of women in the organizations' boards have a negative effect on the firm's performance. This negative impact might be related to their risk aversion and the implementation of less risky policies. In addition, we find that the presence of women in the boards of directors is not influenced by the type of the main shareholder. Firms with less assets and a larger number of directors on the board have more women as directors.

This study is organized in four main sections. In the first section we present a brief review on previous studies, describing the theoretical arguments. In the second part we present the process of data selection and the sample, as well as the description of the methodology we apply in the empirical analysis. In section three, we present and discuss the main results of the study. Finally, in the last section, we present the main conclusions.

2. LITERATURE REVIEW

In the first section of the study, we will carry out a brief literature review. Primarily, a brief contextualization using other authors' studies, to help understanding the influence of boards' composition to firms' performance. In a second stage, we will aboard specifically the position women occupy in firms and try to have an idea of what are the implications of their role in firms' decisions.

2.1. Board's compositions and its influence on firm performance

There are countless factors that contribute to firms' performance, and in a similar way to various other aspects of countries' economy, some have more relevance and provide a greater contribution than others.

Analogously, the functioning and *modus operandi* of companies are more related and dependent of some elements over several others. Thereby there are a significant number of studies analysing different elements that have been stipulated, by the diverse authors, to be more important and relevant to the society.

With the evolution of time, society suffers transformations, implying new ways of living, new attitudes and new habits. With all this, the integration of women into the labour market has become an increasingly important topic, and consequently debated and studied.

The companies' boards have a direct contribute to their performance and consequently, to their outcomes. First, company directors are the element with greater power to influence corporate outcomes, since they are responsible for the making decisions process and implementing various strategies that will define how the company works and approaches the different markets.

Over the years, we found a growing concern about the board meetings and the influence of their decisions on companies' performance. Indeed in the last years, a growing number of studies have been done in order to analyse the influence of the boards' composition / structure on the company value.

The companies have as main objective to maximize their value and, consequently, the shareholders wealth, so they try to constitute their boards qualitatively to achieve this objective as satisfactorily as possible. And this constitution must involve at least a qualitative idea about the trade-offs of demographic diversity.

As mentioned before, and bearing in mind that companies want to maximize its value, the boards are build-up of directors to answer two important functions for companies: monitor and provide resources.

The natural evolution of societies causes the appearance of new concepts, one regards companies' workforce. The capital of the board is connected with two important functions of boards in organisations: the provision of resources and monitoring. The elements of board capital can be perceived as experience, skills and connections to organizations of strategic importance. These elements, that are the most likely to facilitate the provision of resources, also facilitate monitoring, suggesting that best practices for board composition emphasizing board capital will positively influence both board functions (Hillman & Dalziel, 2003).

However, with the prospect of the agency theory, Hillman and Dalziel (2003) argue that the incentives of boards only affect monitoring and suggest that both provision of resources and monitoring are limited to the capital of the board.

It is also important to relate the diversity of boards with its size and try to understand its impact on firms' outcomes, or in other words understand what kind of effects board size and diversity have on firm performance. Through the literature, it is possible to find evidence that board diversity may represent a significant limitation to the changing strategies (e.g., Goldstein, Gautam & Baker, 2006).

Hermalin and Weisbach (1991) also analysed the differences in performance of companies caused by the board composition and size. Studying the same problem, Klein (1998) used the structure of the boards (committees) and the role played by directors of companies in these committees. Hermalin and Weisbach find evidence that board's composition is not related to the company's performance, that size has a negative relation to the firm's performance and that both board's composition and size are related to more qualitatively decisions. Klein finds a positive relation between the percentage of inside directors on finance and investment committees on accounting and stock market performance measures and also that firms significantly increasing inside director representation on these two committees (finance and investment) experience significantly higher contemporaneous stock returns and return on investments than firms decreasing the percentage of inside directors on these committees.

Ferreira (2010) presents several advantages and disadvantages of diversity in boards. Like other authors, Ferreira admits that people with different life experiences originate creativity and diversity of perspectives to analyse problems. This diversity makes available to the company several resources, if the company has the ability to understand these differences and take advantage of the different characteristics of their workers. However, Ferreira points out that this diversity may generate some conflicts, lack of cooperation and may hinder communication, reducing interpersonal attraction. It may be possible that companies select managers with little experience and appropriate qualifications and thus overlook characteristics that may have influence on firm's performance.

As mentioned above, there are many variables that can be studied to investigate the diversity of companies' boards, therefore there are also many authors writing about the subject, making the literature extensive.

The gender composition of teams may be an influence on gender performance gap. This relationship is analysable through experiments with wages based on the team performance or on the outcome of a competition between teams. Being possible to find evidence that in an environment without gender diversity, introducing gender diversity increases the gender performance gap regarding the wages based on team performance and decreases the gap relative to competition between teams. Indicating a tendency for the existence of a "tension" between the objective to maximize performance and minimize gender inequality and its consequences (Ivanova-Stenzel & Kübler, 2005).

According to some of the authors cited above, such as Hermalin and Weisbach (1991) and Klein (1998), it is possible to relate the diversity of groups to their companies' outcomes. This combination leads to positive outcomes, contributing to higher quality decisions with group thinking in a more complex, complete and near reality way (Morrison, 1992). There are, however, other types of relations and influences that can be caused by group diversity. Robinson and Dechant (1997) analyse the relationship between team diversity and the market penetration of firms, finding that diversity enables companies to better and easier penetration in various markets. In addition, the authors conclude that diversity has a positive relationship with creativity and innovation. With more diverse groups there is a greater number of alternative perspectives encouraging /

reinforcing problem solving. Thus, it suggests that diversity can present itself a positive factor for the company's outcomes.

Another perspective involves the value individuals attach to diversity. According to Haslam, Platow and Van Knippenberg (2007), it is possible to associate the work group diversity and group identification and observe that the more individuals believe in the value of diversity, the higher is the positive relation between them.

According to Hambrick, Seung Cho and Chen (1996), the diversity of groups of companies in terms of functional backgrounds, which occurs at the level of experience, education and company ownership, are more likely to act competitively, providing answers and actions of significant magnitude. However heterogeneous teams are slower in their actions and responses and are less likely to respond to the initiatives of their competitors.

The diversity of boards may be examined, as previously mentioned, using different variables. For example, Giuliano, Levine and Leonard (2006) examine the diversity based on differences in ethnicity, age and gender between managers and subordinates. These authors find that the differences have a statistically significant result and may have major adverse effects on employment.

Analysing the banking industry, Hagendorff (2012) find that positive returns for announcements of mergers approved by the board members diverse in terms of training, age and detention are associated with wealth losses during the acquisition announcement and gender diversity not leads to a measurable effect.

Carter, Simkins and Simpson (2003) provide the first empirical evidence that is dedicated to the relationship between the diversity of boards and the improved financial value, concluding that there is a positive relationship between the fraction of women or minorities on boards of companies and their value. In addition, the authors conclude that the proportion of women or minorities in the boards increases with firm and board size, but decrease as the number of insiders increases.

A question that becomes essential to answer is to realize the type of relation between the board of directors and its constitution as well as the value they create for the company.

This connection can be explored by examining the relationship between demographic diversity on boards of directors and the companies' performance. Defining as indicators of company performance the return on assets and investment to measure the

financial performance and connecting them with the percentage of women and minorities on the boards of directors, Erhardt, Werbel and Shrader (2003) find a positive relationship between diversity and company performance.

In general, the analysis and studies dedicated to this topic are concerned with the relation between the diversity of gender or ethnicity and the companies' performance. However, it is still possible to identify two reasons that justify the relation between boards' diversity and companies' performance, which are the companies' reputation and innovation. A greater diversity in the boards has a positive influence on both reputation and innovation, and both have a significant contribution to the relationship between ethnic diversity and firm performance and, finally, greater gender diversity results in greater scale innovation (Miller & Triana, 2009).

Shukeri, Shin and Shaari (2012) analyse a sample of Malaysian companies, identifying some characteristics of board meetings as fundamental elements to firms' performance. The board size and ethnic diversity have a positive relationship with the return on equity (a measure of financial performance of the company) and the independence of the board has a negative relationship. Unlike the results of several studies in many other countries, in Malaysian companies, managerial ownership, the duality of the CEOs and gender diversity do not have a significant impact on company's performance.

Hoffman and Maier (1961) try to understand the effect of the diversity of boards in the quality of decisions that companies make, but try to analyse this diversity as to the value of the groups or the attitudes they take and their contribution to the outcomes. This study in particular, stands out because even creating problems that create emotional conflict, the more heterogeneous a group is, the higher quality and efficiency in solving problems they may have, which only reinforces previous research of Hoffman.

Cox, Lobel and McLeod (1991) affirm that diversity allows us to understand human transactions, there are some elements that are not comparable, however, others, such as age, the role that the individual plays in his work and religion, are comparable and changeable. They combine the results of certain businesses effects of cultural diversity and relate them to the physical and cultural identities of the members of the organizations.

In their study, Cox, Lobel and McLeod (1991) examine board diversity as a factor of company performance, identifying two effects that influence the efficiency of organizations. Diversity promotes differentiation within the company and therefore

stimulates the diversification of companies' strategies, making companies stand out in the market and in marketing. Companies experience higher levels of innovation and creativity, which allow for a greater and a faster response to problems, having greater flexibility. According to these authors, it is possible to obtain benefits from diversity, because it attracts qualified and more talented work force.

Thus, cultural diversity can generally strengthen and encourage team work (Ely and Thomas, 2001).

This cultural diversity originates heterogeneous groups that are a potential advantage for companies, as they have the possibility to consider more alternatives to strategize and solve problems (Eisenhardt, 1989; Miller, 2009).

This whole concept of diversity comes from a previous phenomenon, migration, which is responsible for cultural interaction, leading to a learning globalised process. However there is a negative effect on the employment level of the company with an increasing cultural diversity (Brunow & Blien, 2011).

The functional diversity of ownership and diversity of the company influence, directly and through their effects on the processes of internal and external communication, the companies' performance.

However, despite diversity produces processes that make possible the performance of the company, the direct negative effects of diversity on the company's performance outweigh the indirect positive effects of the processes carried out by groups (Ancona & Caldwell, 1992).

These studies have been focused on large companies. There is, therefore, a more extensive literature in this field. In this sense, this study tends to add some information to those studies that have been carried out so far. Besides concentrate on large firms this analysis includes the biggest firms and the companies with the best sailing rates.

2.2. The impact of women's position on firm's decisions

Diversity can be measured using several variables, such as age, ethnicity and nationality, but gender is a variable that has gained substantial importance in recent years.

Throughout this study, we intend to highlight the diversity of gender and its influence to the outcomes of the companies.

Considering this, several authors have investigated the influence of the entry of women into the labour market and what are the consequences of having those occupying crucial positions in companies (Hoffman & Maier, 1961; Carter et al, 2003; Daily & Dalton, 2003).

One of the main functions of the management is control, which can be achieved by working monitoring. This task can be affected by the composition of the companies with respect to gender.

Campbell and Mínguez-Vera (2010) analyse a sample of Spanish Small and Medium Size firms (SME), a country with a history unfavourable to women, and have studied the impact of the gender composition of SMEs on Spanish boards of directors. The authors found that women's presence on boards generates a negative impact on firm performance and this result may be due to less risky strategies implemented by women directors. The bigger decision-making capacity of women on boards of SMEs can lead to the adoption of less risky policies and have a negative effect on firm performance.

Some years later, Mínguez-Vera and Martin (2011) analyse the gender diversity of a sample of Spanish SME, and conclude that women's presence on boards has a negative impact on firm performance. They also find evidence that family firms and firms with a financial institution as the main shareholder tend to have more women on their boards. Finally, they realize that firms with less debt, more assets and larger boards have more women as directors.

In the case of Swedish companies, the diversity of the gender has a negative impact on returns on total assets of the companies after two years. They find that board size is negatively related to firm performance, supporting theories that more gender diverse boards are associated with costs (e.g., conflicts, slower decision-making) which reduce profitability (Daunfeldt & Rudholm, 2012).

A more gender-diversified board might lead to a better understanding of markets that are themselves diversified in terms of gender; might increase firm creativity and innovativeness; might improve the decision-making as more alternatives and their consequences are evaluated; might have a positive effect on consumer behaviour by improving the image of the firm; and might have positive dynamic effects by improving

the career opportunities of women, thereby increasing the quality of candidates for top positions in the future (Daunfeldt & Rudholm, 2012).

It is important to understand the presence of women on the board and how they, playing a role as Director, recognize the dynamics of board meetings. There are some differences between male and female perception, concerning the group dynamic. Women who have non-traditional educational experiences can have a more negative perception than other female directors. However, the differences on education and training are reducing drastically, nowadays. Therefore, there is evidence of a positive relationship between the presence of women on boards and their perception of companies' dynamics (Mathisen, Ogaard & Marnburg, 2012).

There is, however, another approach with regard to this perception by women. Elstad and Ladegard (2010) study sample of Norwegian companies. The authors examine to what degree women perceive that they contribute to the decisions on corporate boards, and to what extent this perceived contribution of each woman increases when the ratio of women increases on the board. The results show that the higher the ratio of women, the greater the level of perceived influence, perceived social interaction outside the boardroom, and to some degree, perceived information sharing. Women have a greater ability to share information, a low level of self-censoring and higher ability to influence the different members of the board.

Desvaux, Devillard-Hoellinger and Baumgarten (2007) highlight the role of women in business and present a study that reveals positive contribution, with regard to the relationship between women on companies' boards and job positions of greater importance in the management and performance of the company.

3. Sample, Data and Methodology

3.1. Sample

The companies used to constitute this study sample were the 500 biggest and best Portuguese companies that prevail in the annual special edition of "EXAME" Magazine, published on December 2013. The analysts from the magazine based their choice of the best companies of the 27 sectors of EXAME's 500 on the following criteria: sales increment; net income increment; return on assets; return on equity; sales profitability (measured by operating income); the relation between gross added value and net sales; solvability and liquidity (measured by the current ratio). With these indicators it is possible to assess the contribution of the organizations to the economy, to verify their dynamism, measure their profitability and understand the financial equilibrium. These characteristics are essential to the country's economy future, achieved by the business sustainability and company's prevalence.

Consequently, our sample consists of 500 non-financial organizations for the year of 2012. Data were obtained from SABI (*Sistema de Análisis de Balances Ibéricos*), a private database provided by Bureau van Dijk.

3.2. Investigation Questions

To carry out the analysis and obtain the results, the study is divided in parts, and three models will be used, to answer three questions, that constitute the study objective:

- "What is the effect of the presence of female directors in the 500 biggest and best organizations in their performance?".

  This question will relate the women's presence on the boards to the firms' performance, and help to understand the impact of their presence to the firms' performance;
- "Can the risk aversion of women directors affect the risk level of firm and enrich the firm's performance?".

  The second question relates the women's presence on firms' board and the firms' risk. We will try to relate the results to the firm's performance and try to have some justification for the results;

- "What characteristics of the organizations influence the presence of women on boards?"

  The last question helps to shed light on some characteristics that can benefit the presence of women on the boards of directors.

3.3. Dependent Variables

This study is based on three models that hold, as dependent variables the following variables:

The firm's performance, measured as the return on equity (ROE). This variable is used in the first model to help determining the relationship between female board membership and firm performance.

The firms' risk (RISK), measured as the logarithm of the variability of ROE 5 years before, to relate the women's presence on boards with the risk.

The last model uses as dependent variable WOMEN, which includes a measure of women's presence on the board of directors, PWOMEN and DWOMAN. PWOMEN is the percentage of women on the board and DWOMAN is a dummy variable that takes the value one when at least one woman is present on the board, and zero otherwise.

3.4. Independent and Control Variables

For the first two models, we define several independent variables, as proxies for the gender diversity of the board of directors: the variable DIVERSITY that includes, alternatively, the variables PWOMEN and DWOMAN, as defined before.

However, it is argued that these variables are not enough to measure diversity (Ancona & Caldwell, 1992). Consequently, we consider two additional measures of gender diversity. The number of gender categories (two) – Variety and the evenness of the distribution of board members among the two gender categories, denominated as Balance. It is possible to combine into 'dual concept' these measures of diversity (Stirling, 1998). The first is the BLAU Index (Blau, 1977), which is calculated as $1 - \sum_{i=1}^{n} P_i^2$, where P_i is the percentage of board members in each category and n is the total number of board members. This index for gender diversity range from 0 to 0.5, which occurs when the

board is composed of an equal number of men and women. The second measure is the SHANNON Index (Shannon, 1948), obtained as $-\sum_{i=1}^{n} P_i \ln P_i$, which variables have already been defined before in the Blau Index. This measure varies between 0 and 0.69, once more when we have an equal proportion of men and women in the board. These second measure yields a larger number than the Blau index and is more sensitive to small differences in the gender composition of boards, because it measures diversity through the logarithm.

For the third and last model, we consider an independent variable that indicates the type of the main shareholder (MAIN), defined by the following dummy variables: FAM, that takes the value one if the main shareholder is a family member, and zero otherwise; FIN that takes the value one if the main shareholder is a financial institution, and zero otherwise, and FNIN, that takes the value one if the main shareholder is a non financial institution, and zero otherwise.

Besides these variables, we consider the following control variables (CV): the level of debt (LEV), calculated as the ratio of total debt to total assets, the firm age (AGE), calculated as the logarithm of the age of the firm, the number of employees (EMP), computed as the logarithm of the employees' number, the number of directors (NDI), considering the logarithm of the number of directors, and finally the total assets (AS), as the logarithm of total assets. Many of these variables have already been used in previous studies (e.g., Ancona & Caldwell, 1992; Carter et al., 2003).

3.5. Methodology

In this section, we present the econometric models, for the linear regression we will estimate, using the least square method to estimate the regressions. The methodology applied is based on the study of Mínguez-Vera and Martin (2011).

Model one was estimated to analyse the nature of the relationship between female board membership and firm performance, being expressed as follow:

$$ROE_i = \beta_0 + \beta_1 DIVERSITY_i + \sum_{J=2}^{4} \beta_j CV_{ji} + \mu_i \quad (1)$$

The variable DIVERSITY includes, alternatively, the percentage of women on the board of directors, PWOMEN, and the dummy variable, DWOMEN, previously defined. CV represents the control variables (LEV, AGE and EMP). The expression $\mu_i$refers to the disturbance, or error.

Model two tests if boards with more gender diversity choose less risky strategies, based on the following regression model:

$$LRISK_i = \beta_0 + \beta_1 DIVERSITY_i + \sum_{J=2}^{4} \beta_j CV_{ji} + \mu_i \quad (2)$$

The variable RISK represents the firms' risk, as defined before. The DIVERSITY and CV as defined for model one.

The last model is estimated to find out the determinants of firm diversity, using ROE, RISK MAIN, which represents the main shareholder and CV, as independent variables, to explain the dependent variable, WOMEN, measured by PWOMEN and DWOMAN. The regression model is represented as:

$$WOMEN_i = \beta_0 + \beta_1 ROE_i + \beta_2 RISK_i + \sum_{J=3}^{4} \beta_j MAIN_{ji} + \sum_{J=5}^{8} \beta_j CV_{ji} + \mu_i \quad (3)$$

Taking into account the perspective of this study, as well as the sample, it is expected a positive effect of gender diversity on firm performance. It is only logical to think that in this kind of organizations, with big dimension and with the best results presented, the decisions made by the board of directors have great influence on the firm functioning and performance and the presence of women imply different ways of thinking and solving issues, consequently implementing strategic decisions.

Considering the control variables, a negative sign is expected for the variable LEV, if the level of debt is used as a reinforcing mechanism for the managers. It is also expected a negative sign for AGE and EMP variables, because we expect firms that are operating on the market for longer, will see their performance diminished and the more employees a firm has, the more expenses with employees the firm has, which has a negative effect on their performance.

The companies we are considering are known for their singular characteristics. Therefore, we expect a positive effect for gender diversity on firms' risk. We expect that firms that present this kind of results prevail in the market due to their less risky strategies and policies implemented. The expected signs for the control variables are the same as in the first model.

The vision of the labour market has undergone major changes with the entry of women as active and contributory element to the economy of the countries. There has been a natural evolution in the performance of functions since their integration into the working world. As far as it concerns companies' administration boards, we are witnessing every passing to a greater presence of women playing roles in positions of greater importance. However, mentalities are still changing and, therefore, women are still a scarce commodity in the companies' boards. And if they are still insufficient, they may choose to serve on the boards of better performing firms. We expect a positive relationship between firm performance and women presence on the board. Also a positive sign is expected for the relationship between the presence of women on boards and the firms' risk. Finally it is expectable that firms that have as main shareholder a family member would have more women on the firm's boards, for family reasons. Also firms with more assets and age will have more women on the board.

To allow us to have a perspective of our variables, we present in table 3 the descriptive statistics for all the variables we included in the analysis.

Table 3: Descriptive Statistics

	Mean	Median	Standard Deviation	Minimum	Maximum
ROE	15.7062	13.3050	70.0530	-548.9000	655.9500
RISK	0.2315	0.0935	1.4702	-3.7250	6.6636
PWOMEN	0.1804	0.1667	0.1593	0.0000	1.0000
DWOMAN	0.7404	1.0000	0.4389	0.0000	1.0000
BLAU	0.2450	0.2681	0.1754	0.0000	0.5000
SHANNON	0.3744	0.4434	0.2505	0.0000	0.6900
LEV	67.5893	66.6400	42.359	0.4800	755.97
AGE	1.3505	1.3424	0.3536	0.3010	2.1584
EMP	2.3630	2.4571	0.7669	0.0000	4.3541
FAM	0.1119	0.0000	0.3156	0.0000	1.0000

FIN	0.0262	0.0000	0.1599	0.0000	1.0000
FNIN	0.8595	1.0000	0.3479	0.0000	1.0000
AS	7.9874	7.9148	0.6316	4.9891	10.3192
NDIR	9.0309	8.0000	5.1216	1.0000	42.0000
NDI	0.8836	0.9031	0.2708	0.0000	1.6233

Variables: ROE (return on equity, %), RISK (the logarithm of the variability of ROE, 5 years before), PWOMEN (percentage of women on the board of directors), DWOMAN (binary variable that takes a value of 1 when there is at least one woman on the board of directors, and 0 otherwise), BLAU (Blau index of diversity), SHANNON (Shannon index of diversity), LEV (total debt over total assets), AGE (logarithm of firm age), EMP (logarithm of number of employees of the firm), FAM (binary variable that takes a value of 1 when the major shareholder is a family member, and 0 otherwise), FIN (binary variable that takes a value of 1 when the major shareholder is a financial institution, and 0 otherwise), FOU (binary variable that takes a value of 1when the major shareholder is a foundation, and 0 otherwise), AS (logarithm of the book value of the total assets of the firm), NDIR (number of directors on the board), NDI (logarithm of the number of directors on the board), NDIR (logarithm of the number of directors on the board).

As we can see, about 74% of the sample companies have one or more women on their boards. However, the mean percentage of women on the boards of these companies has a low value, of approximately 18%. This fact may be indicator that women do in fact have a high presence on the firms' boards, but they are in such a low proportion to men, that their opinion may be neglected when it comes to the boards decisions. Mínguez-Vera and Martin (2011) find the percentages of 23% and 11.3% for the variables DWOMAN and DWOMEN, respectively.

4. Empirical Results

Table 4 shows the results of the regression (1), reflecting the effect of the gender diversity, measured by DWOMAN, women's presence and PWOMEN, percentage of women on boards of directors, on firm's performance. The results are presented for a sample that eliminated the outliers that can bias the analysis.

Table 4: Least Squares regression of the influence of women's presence on boards of directors and diversity indexes on the firm performance (ROE)

Variable	Coefficient	Standard Error	Prob.
Panel A: Women presence			
Constant	47.2219	9.0217	0.0000
DWOMAN	-13.1711	5.9277	0.0268
PWOMEN	37.4569	15.5517	0.0164
LEV	1.41E-05	0.0452	0.9998
AGE	-12.7529	5.4621	0.0200
EMP	-4.4688	2.5348	0.0786
Sample: 1 500 IF ROE<200 AND ROE>-200			
N	428		
R-squared	0.0466		16.8423
Prob (F-statistic)	0.0011		
Panel B: Diversity indexes			
Constant	48.5166	8.9503	0.0000
BLAU	266.4526	90.7702	0.0035
SHANNON	-181.2389	63.6341	0.0046
LEV	-0.0012	0.0451	0.9802
AGE	-13.5472	5.4487	0.0133
EMP	-4.6789	2.5263	0.0647
Sample: 1 500 IF ROE<200 AND ROE>-200			
N	428		
R-squared	0.0519		16.8423
Prob (F-statistic)	0.0004		

Variables: ROE (return on equity, %), RISK (the logarithm of the variability of ROE, 5 years before), PWOMEN (percentage of women on the board of directors), DWOMAN (binary variable that takes a value of 1 when there is at least one woman on the board of directors, and 0 otherwise), BLAU (Blau index of diversity), SHANNON (Shannon index of diversity), LEV (total debt over total assets), AGE (logarithm of firm age), EMP (logarithm of number of employees of the firm).

We find a negative and significant effect of the presence of women on boards on firm's performance, ROE. This negative effect is reinforced by the sign and significance of the variable PWOMEN, because their decisions on boards have less weight, since the proportion of women on boards is very low. As they are outnumbered by men's presence on boards, their opinion might be neglected on firm's performance, ROE.

Considering the control variables, we note that the coefficient on LEV is not statistically significant, having no effect on firm's performance. In what concerns the variables AGE and EMP, we find a negative and significant effect on firm's performance.

The second estimation (Panel B) is very similar to the previous analysis. Using the Blau and Shannon indexes, we note that the negative effect of women's presence on the firm's board of directors on the firm's performance is reinforced. The control variables present the same signs as the previous estimation.

These results are consistent with previous evidence found by Cox et al. (1991), Watson et al. (1993), Miller et al. (1998), Ivanova-Stenzel and Kübler (2005), Goldstein, Gautam and Baker (2006), Giuliano, Leonard and Levine (2006), Mínguez-Vera and Martin (2011), among other authors, that find evidence of a negative effect of women's presence on the board of directors on the firms performance.

These results help us to answer the first question placed: What is the importance of female directors in the 500 biggest and best organizations' performance?" the answer considering our sample and regarding our results is, according to what we were expecting: gender diversity has a negative impact on firm's performance. Much can be explained if we consider the descriptive statistics presented before. The proportion of women on boards is low, which makes us believe that women opinion has low influence on the decisions board make. Other possible reason is related to the risk aversion of women. We assumed that risk aversion might have influence on women that have a position on organizations' boards, and implement less risky strategies can be responsible for the reduction of firm performance. Indeed, Bogan and Just (2013) find evidence that male presence on the firms' decision teams increases the profitability of selecting a higher risk investment.

Table 5 shows the results of regression (2), reflecting the effect of the gender diversity on the firm's risk.

Table 5: Least Squares regression of the influence of women's presence on boards of directors and diversity indexes on the firm risk (RISK)

Variable	Coefficient	Standard Error	Prob.
Panel A: Women presence			
Constant	0.0716	0.2529	0.7774
DWOMAN	0.0211	0.1598	0.8949
PWOMEN	-1.0033	0.4131	0.0156
LEV	0.0019	0.0011	0.0960
AGE	-0.1561	0.1570	0.3208
EMP	0.0654	0.0687	0.3419
Sample: 1 500 IF LRISK<2 AND LRISK>-2			
N	362		
R-squared	0.0393		-0.0284
Prob (F-statistic)	0.0136		
Panel B: diversity indexes			
Constant	0.0285	0.2530	0.9104
BLAU	-2.5608	2.4449	0.2956
SHANNON	1.2930	1.7220	0.4532
LEV	0.0019	0.0011	0.0945
AGE	-0.1509	0.1573	0.3381
EMP	0.0699	0.0690	0.3119
Sample: 1 500 IF LRISK<2 AND LRISK>-2			
N	362		
R-squared	0.0316		-0.0284
Prob (F-statistic)	0.0427		

Variables: ROE (return on equity, %), RISK (the logarithm of the variability of ROE, 5 years before), PWOMEN (percentage of women on the board of directors), DWOMAN (binary variable that takes a value of 1 when there is at least one woman on the board of directors, and 0 otherwise), BLAU (Blau index of diversity), SHANNON (Shannon index of diversity), LEV (total debt over total assets), AGE (logarithm of firm age), EMP (logarithm of number of employees of the firm).

We can observe that women's presence on organizations' boards on firm's risk has a non significant effect, which is reinforced by the descriptive statistics presented before, because there are a large percentage of firms that have women on their board of directors. However, as they are in a low proportion compared to the proportion of men, their opinion, or risk aversion has no significant impact on the firm's risk. For a level of 10% of significance, we find that the level of debt of the firm has a positive and significant effect on firm's risk. This evidence is consistent with the arguments of Ancona and Caldwell (1992), Campbell and Mínguez-Vera (2010) and Daunfeldt & Rudholm (2012), highlighting the negative impact of the presence of women on the boards of directors on the firms' risk, causing lower performances.

Finally, the last model is presented in table 6, where we can find the determinants of women's presence on their boards. The last analysis was driven to try to understand the characteristics of companies allow a larger presence of women, not only in the companies,

but specially the characteristics that are more favourable for women's presence on board of directors.

Table 6: Least Squares regression of the determinant of women's presence on the board of directors

	PWOMEN			DWOMAN		
Variable	Coefficient	Std. Error	Prob.	Coefficient	Std. Error	Prob.
Constant	0.7539	0.1897	0.0001	1.0568	0.4978	0.0343
ROE	0.0001	0.0002	0.5904	-0.0006	0.0005	0.3090
RISK	--0.0174	0.0055	0.0017	-0.0413	0.0144	0.0044
FAM	-0.4528	0.1580	0.0044	-0.4326	0.4146	0.2974
FIN	-0.3840	0.1625	0.0186	-0.2671	0.4265	0.5315
FNIN	-0.4801	0.1565	0.0023	-0.4557	0.4106	0.2678
LEV	3.86E-05	0.0002	0.8298	0.0003	0.0005	0.5963
AS	-0.0286	0.0141	0.0429	-0.0811	0.0369	0.0284
NDI	0.0479	0.0344	0.1649	0.6692	0.0902	0.0000
AGE	0.0598	0.0233	0.0104	0.1318	0.0610	0.0313
Sample: 1 500 IF ROE<200 AND ROE>-200						
N	422			422		
R-squared	0.0832		0.1765	0.1922		0.7228
Prob (F-statistic)	0.0000			0.0000		

Variables: ROE (return on equity, %), RISK (logarithm of the variability of ROE relative to the year before), LEV (total debt over total assets), AGE (logarithm of firm age), EMP (logarithm of number of employees of the firm), FAM (binary variable that takes a value of 1 when the major shareholder is a family member, and 0 otherwise), FIN (binary variable that takes a value of 1 when the major shareholder is a financial institution, and 0 otherwise), FOU (binary variable that takes a value of 1when the major shareholder is a foundation, and 0 otherwise), AS (logarithm of the book value of the total assets of the firm), NDIR (number of directors on the board), NDI (logarithm of the number of directors on the board), NDIR (logarithm of the number of directors on the board).

According to the results presented on table 6, the impact of firms' performance (ROE) on the presence of women in the boards is not statistically significant, which suggests that women do no choose to serve in firms with better levels of performance. However, we find a negative and significant effect of the firm's risk on the presence of women, which may be evidence that women do prefer firms with less levels of risk. As for the main shareholder, we find evidence that having financial or nonfinancial institutions or family member as a main shareholder is prejudicial for women's presence on the boards.

We also find evidence of a negative relationship between firms total assets and women on their boards as well as that firms with a larger number of directors and older will have more women on their boards.

It is possible to understand that the fact that the major shareholder being a family member, or a financial or nonfinancial institution have negative effects on the presence of women on boards of companies with characteristics similar to our sample, as mentioned before:"...sales increment; net income increment; return on assets; return on equity; sales profitability measured by operating income; relation between gross added value and net sales; solvability and liquidity.". This fact might be a good sign, revealing that women obtain such important positions through their work and effort, and see this work recognized. The total assets have a negative and significant effect and the number of directors has a positive and significant effect on women's presence, on the boards of the companies.

5. Conclusions

Nowadays, the labour market is more and more competitive and organizations have to struggle to survive in this environment. Women play each day more important roles in the economy of countries. This fact makes necessary the comprehension of the impact of women, in society.

In this context, this study analysed the impact of the gender diversity on boards of directors, considering a sample of 500 biggest and best Portuguese organizations selected by the EXAME magazine, in their special annual edition, from 2013. The criteria for the selection of companies, allow us to evaluate the contribution of these organisations for the economy, to understand their dynamism, measure their profitability and understand their financial equilibrium, which is determinant to guarantee the firms' future sustainability.

For this analysis, the impact of the presence of women on board of directors on firms' performance and risk and the determinants for their presence on the boards was measured by several variables, using a least square estimation.

The study reveals its importance, because it uses the biggest and best Portuguese companies, which means that the organisations used in the sample already represent great source of profitability, employment, etc for the economy. They are large firms, which means the board's decisions are fundamental for their performance and the presence of women on boards may have influence in their functioning.

Overall, the results show evidence that the presence of women on companies' boards has a negative effect on firm performance. We conclude that the reduction on firm performance might be related to the risk aversion. Considering the percentage of women on boards, we find a negative impact on firm's risk, which means that women might choose less risky investment policies and strategic decisions.

This helps to attribute a position of women's contribution for the functioning of companies. We find that in the actual conjecture, the presence of women on boards is not being enriched or favoured by the main shareholder being a family member or financial or non financial institution, revealing that women hold important positions in these organisations by their own merit.

This study has some limitations. Once is the reduced number of observations. Thus, we think it will be important in the future to enlarge the period of the sample analysis.

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Appendix I – Models and Variables description

Model 1:

$$ROE_i = \beta_0 + \beta_1 DIVERSITY_i + \sum_{J=2}^{4} \beta_j CV_{ji} + \mu_i \quad (1)$$

Variable name	Definition
return on equity - ROE	Firm performance
DIVERSITY: PWOMEN	percentage of women on the board of directors
DWOMAN	a dummy variable that takes a value of one when one or more women are present on the board, and zero otherwise
Blau Index	Values of the Blau index for gender diversity range from 0 to a maximum of 0.5 which occurs when the board is comprised of an equal number of men and women.
Shannon Index	the minimum value of the index is zero and diversity is maximized when both genders are present in equal proportions, which gives rise to a value of 0.69
Control variables	
LEV	the level of debt (calculated as the ratio of total debt to total assets)
AGE	the age of the firm
EMP	the logarithm of the number of employees

Model 2:

$$LRISK_i = \beta_0 + \beta_1 DIVERSITY_i + \sum_{J=2}^{4} \beta_j CV_{ji} + \mu_i \quad (2)$$

Variable name	Definition
LRISK	the logarithm of the variability of ROE **5 years**before as a measure of firm risk
DIVERSITY: PWOMEN	percentage of women on the board of directors
DWOMAN	a dummy variable that takes a value of one when one or more women are present on the board, and zero otherwise
Blau Index	Values of the Blau index for gender diversity range from 0 to a maximum of 0.5 which occurs when the board is comprised of an equal number of men and women.
Shannon Index	the minimum value of the index is zero and diversity is maximized when both genders are present in equal proportions, which gives rise to a value of 0.69
Control variables	
LEV	the level of debt (calculated as the ratio of total debt to total assets)
AGE	the age of the firm
EMP	the logarithm of the number of employees

Model 3:

$$WOMEN_i = \beta_0 + \beta_1 ROE_i + \beta_2 LRISK_i + \sum_{J=3}^{4} \beta_j MAIN_{ji} + \sum_{J=5}^{8} \beta_j CV_{ji} + \mu_i \quad (3)$$

Variable name	Definition
WOMEN: PWOMEN	percentage of women on the board of directors
DWOMAN	a dummy variable that takes a value of one when one or more women are present on the board, and zero otherwise
ROE	Return on Equity
LRISK	the logarithm of the variability of ROE **5 years** before as a measure of firm risk
Main Shareholder	
FAM	binary variable that takes a value of 1 when the major shareholder is a family member, and 0 otherwise
FIN	binary variable that takes a value of 1 when the major shareholder is a financial institution, and 0 otherwise
FNIN	binary variable that takes a value of 1 when the major shareholder is a non financial institution, and 0 otherwise
Control variables	
LEV	the level of debt (calculated as the ratio of total debt to total assets)
AGE	the age of the firm
LAS	logarithm of the total assets of the firm
LNDIR	the logarithm of the total number of directors